Food and Technology GA 3: Written examination

GENERAL COMMENTS

The 2002 examination was designed to assess student knowledge and understanding of Unit 3, areas of study 1 and 2 and Unit 4, areas of study 1 and 2. The four examination criteria were drawn from the four areas of study. The paper consisted of nine short-answer questions, which were based on the four examination criteria.

Areas of strengths and weakness

Strengths included:

- explaining how social factors influence the foods that are eaten
- understanding niche markets and the foods developed for them
- explaining the role of technology in the development of modified products
- explaining the role of cook-freeze home meal replacements
- explaining the role of packaging in the sale of successful products
- demonstrating understanding of the labelling requirements of food and how this information is used by the consumer
- demonstrating understanding of health and safety practices in food production
- demonstrating understanding of the reasons for modifying food products and the resulting foods.

Weaknesses included:

- explaining key food commodities and their role in primary and secondary processing
- explaining why specific tools and equipment are used with modified foods
- explaining the role of product, place, promotion and price in a marketing strategy
- explaining the advantages and disadvantages of irradiated foods for consumers and/or food producers
- explaining the role of Australia and New Zealand Food Authority (ANZFA) in relation to foods available to the consumer
- explaining and comparing food production systems
- providing irrelevant answers or those not directly related to the questions asked.

SPECIFIC INFORMATION

The information below should be read in conjunction with the 2002 Food and Technology examination.

Question	Marks	%	Response
Question 1	Students were required to name a key food commodity and use this commodity to answer the remaining parts of the question. Fruits and vegetables, cereals, fats and oils, milk, eggs, meat and poultry and fish are all key commodities and students could nominate specific foods, e.g. wheat, apple, eggs, butter, chicken or milk. Many students answered this incorrectly or did not attempt the question at all.		
	a 0/1 1/1 (Average mark 0.44)	 56 44	Suitable answers included: **Key food commodity**: chicken or milk or wheat (no mark) **Origin**: poultry or cow or wheat plant.
	b 0/1 1/1 (Average mark 0.65)	 35 65	**Food which results from secondary processing:** oven baked chicken nuggets or yoghurt or bread.
	c 0/4 1/4 2/4 3/4 4/4 (Average mark 1.35)	 39 18 21 12 10	**Primary processing:** raw foods after harvest or slaughter are prepared for consumption or for turning into other products. Includes transporting, sorting, cleaning and blending, e.g. wheat is cleaned; grain is conditioned; tempered to soften it; breakrolling; sieving to separate bran and flour. **Secondary processing:** changes primary processed foods into other food products, e.g. ingredients are measured or weighed. Ingredients are mixed. The dough is divided or moulded to shape. Allowed to rise. Baked and packaged.

Question 2	**a** 0/2 19 1/2 32 2/2 49 (Average mark 1.29)	Students needed to refer to the pie chart to respond to this question. Suitable answers included: People demand healthier foods. People are more aware of labelling and nutritional content of foods. Manufacturers identify a market and therefore create these foods.
	b 0/2 26 1/2 30 2/2 44 (Average mark 1.17)	Suitable answers included: Posters showing healthy foods being eaten by healthy working people. Ads using sporting personalities. TV advertising during peak viewing times, promotions and use of all types of media.
	c 0/3 18 1/3 15 2/3 33 3/3 34 (Average mark 1.83)	Social factors could include any of the following: larger number of working women, longer working hours, lack of cooking skills, desire for more leisure, more casual eating or multi-cultural influences. Explanation: less time to prepare food at home. Need to eat out more often.
	d 0/3 25 1/3 8 2/3 21 3/3 46 (Average mark 1.88)	Students responded to this question well. Suitable answers could have included the following food products: Skinny milk, Physical, Rev or other modified milks, Ready Eggs, modified margarines, gluten free products (not gluten free flour), decaffeinated products and special diet foods. Explanation: Specific health concerns. Consumers concerned about their fat or cholesterol intake demand reduced fat products. Low fat milk is an alternative to full cream milk for these consumers and can still be used in the same way.
Question 3	**a** 0/2 41 1/2 9 2/2 50 (Average mark 1.08)	Students answered this question quite well. Suitable answers included: Microwave technology (ovens); genetic engineering; new methods of packaging, e.g. aseptic; plant cell technology; new methods of preservation; process engineering; UHT and software programs for ordering stock.
	b 0/2 73 1/2 12 2/2 15 (Average mark 0.41)	This question (similar to Question 3e in the 2001 examination) was poorly answered. Tools and equipment need to suit the characteristics or properties of the modified food. The characteristics or properties may be different from those of the original food for example, dairy soft butter is softer than normal butter; therefore, a wooden spoon could be used to mix rather that an electric mixer. • low fat milks are more suited to heating in a non-stick-coated pan as they may stick to a normal saucepan and brown • Ready Eggs frozen egg whites do not whisk as well as fresh whole egg whites and an electric beater or rotary beater should be used instead of a hand whisk or fork.
	ci 0/2 22 1/2 44 2/2 34 (Average mark 1.12)	Students needed to explain the cook-freeze process in a commercial or industrial setting not in a domestic situation and state that the food is fully cooked and packaged. It is then blast frozen or frozen by passing extremely cold air over the cooked food or rapidly frozen and then stored at minus 18 degrees Celsius for an extended period.

cii

0/4	3
1/4	7
2/4	32
3/4	22
4/4	37
(Average mark 2.82)	

This question was well answered. Most students gave two reasons that linked to using a cook-freeze home replacement meal rather than preparing a meal using fresh ingredients and supported them with explanations. Good answers included longer shelf life, convenience, variety, and ease of preparation, individual servings or lack of cooking skills.

Question 4

This was a comprehensive question on new packaging techniques. The packaging techniques listed by students needed to be recently developed packaging techniques. Canning or ring-top pull cans were not considered recent and no marks were awarded. Some marks were awarded if the remaining information required was correct, but overall section (a) was less successfully answered.

a

0/10	24
1/10	3
2/10	6
3/10	8
4/10	12
5/10	11
6/10	7
7/10	7
8/10	9
9/10	6
10/10	8
(Average mark 4.32)	

Suitable answers could have included the following:

Packaging technique	**Example of a food packaged using this technique**	**Explanation of this packaging technique**	**Reason this technique was developed**
Aseptic	Fruit juice, UHT milks, custards, soups	Packaging and product are both sterilised, food is placed in package while still sterile and sealed.	To minimise the use of preservatives. No refrigeration. Stores at room temperature. Longer shelf life.
Microwave packaging	Any microwavable food	Special films take up heat and these provide even cooking. Positioning of food is important.	Popularity of microwave use. Speed of cooking. Maintain high quality product.
Modified Atmosphere Packaging. (barrier specific, gas, vacuum or active packaging	Cryovac packed meats (vacuum packaging) Meat, fruits and vegetables (gas packaging) Fruit and vegetables (barrier specific) Fresh fruits and vegetables (active).	Withdraws air from packages to form a tight fit around the food. Gas is placed in package with food and sealed. Different gases are used for different foods. Packaging foods with a liner or breathable film allowing gases to enter and leave. Controls or modifies the atmosphere.	Extends shelf life of foods without the use of preservatives. Inhibits the growth of mould or bacteria. Product lasts longer. Suitable for packaging of microwavable foods.

	b 0/2 9 1/2 25 2/2 66 (Average mark 1.57)	Students answered this question well. Suitable reasons linked to increased sales could have included: Produce can be seen easily, more customer appeal, may be more convenient, easy to store, environmentally friendly, packaging may be reusable and product may be easy to store because of packaging.
	ci–iv 0/4 12 1/4 12 2/4 24 3/4 28 4/4 23 (Average mark 2.39)	Students needed to identify four criteria, which could be used to select the most environmentally friendly food packaging. These could be stated as a question or a statement. Not all students linked their answers to the phrase 'environmentally friendly'. Suitable answers included: i. Is packaging minimal for the food it contains e.g. bulk items, lightweight materials and products in concentrated form? ii. Is the packaging material renewable? iii. Is the packaging able to be recycled? iv. Is pollution created during production of packaging material minimal? v. Is the packaging reusable e.g. glass containers? vi. Is use of energy minimal during production?
Question 5	Student answers needed to relate to the information provided in the question.	
	ai–ii 0/2 32 1/2 36 2/2 33 (Average mark 1.01)	**ai** Primary processing makes milk safe to consume. Increases variety of milk products and the milk is readily available, e.g. packaged and prepared for transport. **aii** Secondary processing of the milk will make it more appealing to the customers and provide variety.
	bi–ii 0/2 14 1/2 31 2/2 55 (Average mark 1.4)	**bi** Students needed to relate their answers to the role of the natural food components in the flavoured milk described in the question. Suitable answers included: The role of fat in the flavoured milk is to provide fat-soluble vitamins and add flavour and mouthfeel. **bii** The role of sugar in the flavoured milk is to add flavour and energy.
	c 0/4 22 1/4 19 2/4 25 3/4 19 4/4 15 (Average mark 1.84)	The factors to be described were listed. Students needed to link these to the original information in the question. Some suitable answers were: **Product:** must appeal to the consumer. Flavour, colour, mouthfeel and nutritional content, e.g. meeting dietary needs should all meet with the consumer's approval. **Place:** the product must be readily available, well positioned in the supermarket or other food outlets. **Price:** the product must be an acceptable price for the young women and competitive with any other like products. **Promotion:** consumers must be made aware of the product. Advertising and marketing communications, e.g. leaflets and free samples, recipes and ideas, give away, posters and magazine advertising, will all assist in promotion of the new line of flavoured milk.
	di–ii 0/4 14 1/4 13 2/4 15 3/4 21 4/4 37 (Average mark 2.55)	**di** Suitable answers could have included the following: Me-too **dii** The consumer, original manufacturer and the competitor all needed to be included in the answer given by the students. Consumers have more choice. Original manufacturers – competition can lead to a decreased market share. The competitor may gain increased profit.

Question 6

Students needed to demonstrate their knowledge of irradiation on foods and how this process may affect not only the consumer but the food producer as well. An understanding of the role of Australia New Zealand Food Authority within Australia was also needed. This question was poorly answered and was often not attempted by the students.

a

0/3	37
1/3	24
2/3	23
3/3	16
(Average mark 1.18)	

Suitable answers included:

Benefits of irradiation for consumers and/or food producers could be increased shelf life of the product. The product could have a decreased bacteria count and any insects or larvae on the food would be killed. Irradiation can reduce sprouting in some foods, e.g. potatoes allowing them to last longer and slows down the ripening of fruits and vegetables.

b

0/2	24
1/2	40
2/2	37
(Average mark 1.13)	

Possible reasons for consumers not wishing to consume irradiated foods might be that the process may change flavour and texture. Some consumers believe that it may not be safe and the possible dangers are not yet known. There may be a risk to the workers handling these foods as well as transport and safety hazards. The food may suffer loss of vitamins and the process does not always kill all microorganisms that cause illness.

c

0/4	15
1/4	33
2/4	28
3/4	13
4/4	11
(Average mark 1.7)	

This question was less successfully answered. The answer did not relate totally to the extract provided, but gave students the chance to use previous knowledge. ANZFA does not police any of the laws that they create. Their role is to monitor and update laws and regulations.

Suitable answers included:

The role of ANZFA in Australia is diverse. They are responsible for formulating the Food Laws to protect health and safety and the labelling regulations that provide adequate information to enable consumers to make informed choices about the foods they use. ANZFA oversees food recalls and monitors other food issues e.g. GM foods. Their role is also to promote fair trading in the food industry and promote trade and commerce.

d

0/3	1
1/3	1
2/3	6
3/3	93
(Average mark 2.89)	

Labelling Requirement	**How the consumer would use this information**
Ingredients list	To obtain information about ingredients in case of for example consumer allergies.
Date marking	To know how fresh/usable the product is.
Food recall information	To contact the manufacturer if required.

Question 7

ai

0/2	44
1/2	7
2/2	49
(Average mark 1.04)	

Students were able to identify two different food production systems and give an example of a food typically produced by this system. The name of the production system was often omitted and therefore no marks could be awarded to the example of food only.

Suitable answers included:

Types of production systems and possible food examples.

Job shop: decorated cake

Batch production systems: boutique preserves or pizza in a pizza shop

Continuous production: biscuits at an Arnott's biscuit factory.

aii

0/2	48
1/2	7
2/2	45
(Average mark 0.96)	

b

0/4	47
1/4	8
2/4	16
3/4	11
4/4	19
(Average mark 1.47)	

A comparison of two systems named by the student was required. This was often not attempted and some answers did not indicate an understanding of the systems given. A mark was awarded for each point of comparison given. In comparing batch and continuous systems the product produced by the batch system costs more to make.

The quantity produced in batch production is less than that produced in continuous production. Continuous production provides a more uniform product than batch production and batch production requires more labour than continuous production.

<table>
<tr><td>Question 8</td><td colspan="2">The processing techniques used to prevent deterioration of food were included in the question and students were asked to select one of these for section (a). Many students nominated another process and did not receive any marks. The question required responses related to industrial or commercial settings and not domestic ones. Students often gave answers that only applied to a domestic situation.</td></tr>
<tr><td></td><td>ai–iii
0/5 8
1/5 16
2/5 22
3/5 25
4/5 18
5/5 11
(Average mark 2.6)</td><td>ai
A suitable answer was: technique – dehydration
Food that can be processed using this technique – tomatoes
aii
In a commercial or industrial setting the tomatoes are cut into a suitable size, blanched to deactivate enzymes and may be treated chemically, then dried in a kiln.
aiii
Deterioration of food is prevented because the reduced water content means microorganisms are not able to grow.</td></tr>
<tr><td></td><td>b
0/8 3
1/8 2
2/8 6
3/8 11
4/8 22
5/8 16
6/8 16
7/8 12
8/8 15
(Average mark 5.02)</td><td>Students were required to identify one health and safety practice that would apply to the nominated stages of food production in a sandwich shop. They were also requested to justify the practice that they gave. Many students did not do this.
Suitable answers included:
• design of work area: benches need to be a suitable height to avoid injury; benches should be located away from walkways. Correct materials used in bench construction to avoid contamination. Location of ovens and cook tops, appliances and power points to prevent injury. Correct lighting and ventilation for worker health
• storage of raw ingredients: food should be stored at an appropriate temperature to prevent spoilage and food poisoning. Sealed containers above floor level to prevent infestation by rodents and other insects. Stock rotation to prevent food deterioration
• food handling: staff should wear gloves at all times when handling foods to prevent cross-contamination. Personal hygiene to prevent spreading of germs
• packaging: packaging is needed to protect food from spoilage or damage. To avoid contamination, e.g. well sealed and if pre-made packaging should be labelled clearly with instructions for storage, cooking.</td></tr>
<tr><td>Question 9</td><td colspan="2">Students were able to show their understanding of a modified product and its properties.</td></tr>
<tr><td></td><td>a
0/1 57
1/1 43
(Average mark 0.43)</td><td>A suitable definition of a modified product was required but was not well answered by students.
A suitable answer could have been:
A food product where physical or chemical characteristics of the related traditional or existing food has been changed or altered.</td></tr>
<tr><td></td><td>b
0/2 12
1/2 27
2/2 60
(Average mark 1.48)</td><td>A modification to the margarine described at the beginning of the question and a description of how this modification could increase the manufacturer’s market share was required. Many students did not link this question to the margarine or state how the market share may be increased.
A suitable answer could include:
Decreased fat to appeal to weight watchers.
or
Low salt to appeal to those with special dietary needs, e.g. assists with reducing hypertension.
or
Low cholesterol to appeal to those with special dietary needs.</td></tr>
<tr><td></td><td>c
0/2 26
1/2 39
2/2 35
(Average mark 1.08)</td><td>Students were required to identify and explain two properties of the margarine that would change. This was poorly done.
A suitable answer could include:
Could be lighter in colour – physical; have a reduced flavour – physical; softer in texture – physical; melts more readily – physical and lower levels of fat, salt or cholesterol – chemical.</td></tr>
</table>

	di–ii 0/3 1/3 2/3 3/3 (Average mark 1.57)	 19 25 37 19	**di** Sensory evaluation is used to test the properties of a food for suitability to the consumer. The properties relate to flavour, taste, sight, mouth feel and aroma. **dii** People tasting the margarine and responding to questions about it could carry out sensory evaluation. The responses are analysed.
	e 0/2 1/2 2/2 (Average mark 1.09)	 18 55 27	Students were required to explain why consumers would use the margarine and give an example in their answer. Most students were able to give reasons for use but failed to give an example. A suitable answer would include: Use in sandwiches or in baking or other food preparation activities to reduce the fat, salt or cholesterol in their diet if they are weight conscious or have a medical condition that can be assisted through diet.
	f 0/3 1/3 2/3 3/3 (Average mark 1.9)	 20 13 22 45	Students answered this question well giving a range of criteria that could include: a) Is the flavour acceptable? b) Is the texture acceptable? c) Is the appearance acceptable?